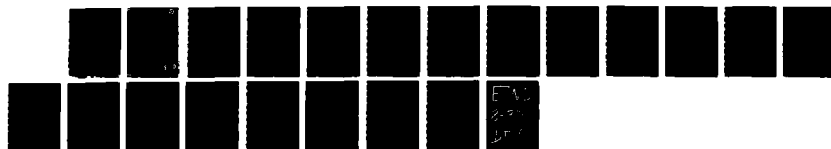AD-A181 949   DEVELOPMENT OF AN AUTOMATED INSTRUMENT TO ASSESS CAREER   1/1
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Development of an Automated Instrument to Assess Career Maturity: The Career Plans Check-Up

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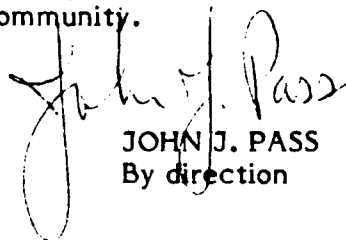SAN DIEGO, CALIFORNIA 92152-6800

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9 June 1987

From: Commanding Officer, Navy Personnel Research and Development Center

Subj: DEVELOPMENT OF AN AUTOMATED INSTRUMENT TO ASSESS CAREER MATURITY: THE CAREER PLANS CHECK-UP

Encl: (1) NPRDC TN 87-26

1.   This research resulted in an automated version of a career maturity assessment instrument previously developed as a potential component in a computerized vocational guidance package for the Army's Joint Optical Information Network (JOIN) system. This computerized instrument rapidly assesses career maturity, assisting the military recruiter to structure the recruiting interview.

2.   The research reported here is expected to benefit the recruiting branches of the Army and Navy and the research community.

JOHN J. PASS
By direction

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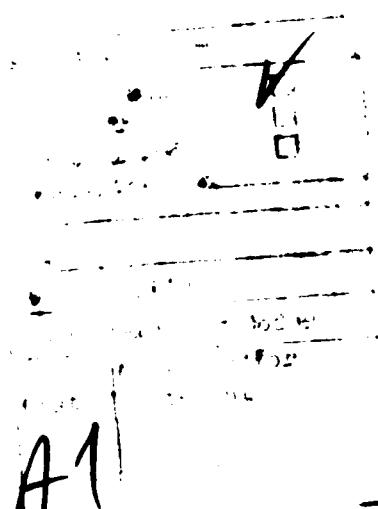
Development of an Automated Instrument to Assess
Career Maturity: The Career Plans Check-Up

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Because many military recruits are young, unskilled workers, there is a need for assessment of career maturity as part of the recruiting process. An existing pencil-and-paper measure, the Career Maturity Assessment (CMA), was validated on Navy recruits, using another existing measure, My Vocational Situation, as the criterion. A computerized version of the CMA was developed, called Career Plans Check-Up, which was validated on Navy recruits, with the CMA as the criterion. The measures were highly correlated. All three instruments measure the same construct, career maturity.

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SUMMARY

Problem

Many military recruits are young, unskilled workers who are not able to make sound career decisions. Recruiters and classifiers do not have professional training as guidance counselors. Also, there is a severe shortage of time for counseling. Computer-based (1) assessment of career maturity and (2) assistance in occupational guidance are needed as parts of the recruiting process. Those recruits could be identified who need more guidance about occupational choices, training opportunities, military career patterns, and the general features of military lifestyle.   → ·ⲓₒ FLD 1ℰ

Objectives

The objectives were to (1) conduct a construct validation of an existing paper-and-pencil instrument, the Career Maturity Assessment (CMA), on a Navy sample; (2) to develop an automated career maturity assessment instrument; and (3) to validate the automated instrument.

Approach

The CMA and the criterion measure, My Vocational Situation (MVS), were administered to a sample of 50 male Navy recruits at Recruit Training Command (RTC) in San Diego. The CMA was programmed in the C-Basic language to operate on a stand-alone microcomputer. The automated version of the CMA, entitled Career Plans Check-Up (CPC), and the MVS were administered to 100 male Navy recruits. Statistical analyses were performed to compare the three instruments.

Results

The correlation between the CMA and the MVS was .78, and between the automated CPC and the MVS .81. These coefficients indicated a strong relationship between both career maturity instruments and the criterion measure.

Conclusions

Both the CMA and the CPC correlated highly with the MVS. All three instruments primarily measure the same construct, career maturity.

Recommendations

1. Document the applicant-recruiter/classifier decision-making process for important categories (school guarantee, GENDET, gender, delayed entry, AFQT category, etc.).

2. Using experienced counselors to interview applicants, document specific topics and areas in which applicants need more guidance.

3. Develop an additional instrument that can quickly identify the needs (documented from recommendation number 2).

4. Administer the CPC to specific Navy subgroups (in recommendation number 1). Use the "needs" information (recommendation number 2) to determine CPC cut-scores for each subgroup.

CONTENTS

LIST OF TABLES

INTRODUCTION

Problem

The military services draw most recruits from unskilled workers ranging in age from 17 to 22. Focus on this population will continue because of the need for a youthful fighting force (Baker, 1985). Many young persons lack knowledge of their own needs and interests as well as knowledge of potential career opportunities and are therefore unable to make sound career decisions. Recruiters and classifiers are not trained guidance counselors; in addition time for counseling is short. Computer-based (1) assessment of need for counseling and (2) assistance in occupational guidance are missing as parts of the recruiting process. Potential recruits who need more guidance in occupational choices, training opportunity, military career patterns, and the general features of military lifestyle should be identified.

Objectives

The objectives were: (1) to construct validate the Career Maturity Assessment (CMA), a paper-and-pencil instrument, using Navy personnel; (2) to develop and refine an automated CMA instrument that would rapidly determine the approximate career maturity of military enlistment applicants; and (3) to validate the new, automated instrument.

Background

Career Development and Career Maturity

Career development has been defined as "the process of unfolding the direction of vocational, social, and personal maturity for the person through a systematic sequence of experiences implementing goals and objectives on a developmental continuum" (Ryan, 1973, p. 28). Super and Overstreet (1960) described five vocational life stages in career development: (1) growth, (2) exploration, (3) establishment, (4) maintenance, and (5) decline. At each stage, a person encounters new problems and demands. According to Hansen and Ansell (1973), individuals should be afforded the opportunity to deal with specific tasks as they proceed through the developmental stages.

During the period of late adolescence, individuals typically first begin to explore career interests. Super (1957) describes three developmental tasks associated with this exploratory period: (1) crystallization, (2) specification, and (3) implementation. Crystallization suggests that a youth's vocational preferences and interests become more differentiated, focused, and consistent. Specification refers to the degree to which individuals have narrowed their vocational preferences. Finally, implementation refers to the actual behaviors taken to achieve vocational goals.

The ability to cope successfully with the tasks of vocational development has been referred to as career maturity. (Although the literature differentiates between career, occupation, and vocation, the terms are used synonymously here.) The concept of career maturity involves both cognitive and affective domains (Crites, 1965). The cognitive domain includes problem solving, planning, gathering occupational information, self-knowledge, and goal selection. The affective domain refers to involvement, orientation, independence, preferences, and conceptions. When assessing rational or emotional behaviors, level of career maturity is usually defined as a point on a continuum of occupational development. The continuum includes one's feelings about a basis for choosing a job and one's conception of the occupational choice process (Sheppard, 1971).

Prior research in career development has explored career maturity in relation to self-concept, socioeconomic status, intelligence, race, and sex. One of the first, the Career Pattern Study (Super & Overstreet, 1960), addressed the concepts of lifestages, developmental tasks, and vocational maturity over 21 years in a longitudinal research design.

Super (1953) emphasized the self-concept factor in career development. Khan and Alvi (1983) also found that subjects with high self-esteem were more vocationally mature than low self-esteem subjects. Lawrence and Brown (1976) found that the socioeconomic status and self-concept seemed to have a lesser effect on career maturity than the intelligence, race, or sex. Their results also indicated that only certain aspects of intelligence (e.g., problem solving and planning abilities) were correlated with career maturity.

Another psychological variable shown to correlate with career maturity is "locus of control." Gable, Thompson, and Glanstein (1976) found that women with an internal control orientation have significantly higher vocational maturity than women with an external control orientation. These authors suggested that career counseling and career education programs should focus on changing an individual's control orientation toward the internal direction. Other research supports the strong relationship between internal locus of control and vocationally mature individuals (e.g., Lokan, Boss, & Patsula, 1982; McIntire, Drummond, & Ryan, 1978).

Work values also correlate with career maturity. Super and Nevill (1984) described a construct termed "commitment to work" that is positively related to career maturity. Miller (1974) found that two intrinsic work values, achievement and creativity, were positively associated with career maturity for females; for males, none of the intrinsic work values was positively associated with career maturity.

Decision making is an important aspect of career maturity. Laskin and Palmo (1983) found that a decision-making class increased students' career maturity. However, Phillips and Strohmer (1982) found no significant relationship between rational decision-making style and vocational maturity. These authors concluded that a number of factors correlate with vocational maturity, not just one or two.

Most prior research indicates that vocational maturity should be viewed as a function of total human development because several psychological and sociological variables are correlated with it. Consequently, Khan and Alvi (1983) suggested that career development programs should be designed around a total educational experience, including higher levels of educational and vocational aspirations, an understanding of one's own strengths and weaknesses, skills in decision making and problem solving, and appropriate work values.

Vocational Maturity Instruments. There are numerous inventories available to assess career or vocational maturity. In 1965, Crites developed the Vocational Development Inventory (VDI), which measures only the affective component of career maturity. Gribbons and Lohnes (1968) developed the Readiness for Career Planning, which employs interview procedures.

Based on the VDI, Crites (1973) developed the Career Maturity Inventory (CMI) to assess an individual's readiness for career decision making relative to that of others of the same age and educational attainment. The CMI includes attitude and cognitive scales. Researchers consider the CMI appropriate for many settings and in evaluating career education programs (Omvig, Tulloch, & Thomas, 1975). Westbrook's (1976) analysis of the

2

subparts of the CMI found substantial correlations among the subparts and also between the attitude and competency measures. The VDI's attitude scale is considered a widely applicable, reliable, and valid measure (Bartlett, 1971).

Westbrook and Parry-Hill (1975) developed the Cognitive Vocational Maturity Test (CVMT), which covers work, job selection, work conditions, education required, attributes required, and work duties. The CVMT is highly reliable, but the validity has been questioned.

Measures of career maturity include the Career Development Inventory (CDI; Super, Thompson, Lindeman, Jordan, & Myers, 1984). The CDI was developed after 15 years of research on the construct of career maturity and is considered a reliable and valid instrument (Super & Nevill, 1984). Another career maturity measure, The My Vocational Situation (MVS; Holland, Daiger, & Powers, 1980) is a 26-item instrument that assesses the respondent's need for vocational assistance and is intended to increase the rate of effective client-treatment interactions (Holland, 1980). The instrument is based on the assumption that most decision making falls into one of three areas: (1) vocational identity (possession of a clear and stable picture of one's goals, interests, personality, and talents); (2) knowledge of occupational information; and (3) barriers (possible external obstacles to reaching occupational goals).

There has been some debate among researchers on the validity and reliability of career maturity instruments. Many of the instruments employed have been difficult to use and are still in the early stages of development. The measures that have been developed provide a global estimate of vocational maturity but lack information on specific areas in which a person needs assistance. Super and Hall (1978) claimed that only some of the dimensions related to career maturity are assessed in currently used career maturity instruments. Furthermore, according to these authors, the predictive validity of career maturity remains to be established.

Use of Career Maturity Instruments in Guidance and Counseling. Some researchers have questioned the importance of measuring career maturity for use in vocational guidance programs. LoCascio (1974) reviewed the most popular career maturity instruments and found bias against minority groups. The tests he reviewed reflected a middle-class orientation in item construction, item selection, and standardization procedures. Consequently, he suggested that it may be necessary to develop models that are both class-specific and culture-specific.

Harmon (1974) questioned the validity of using measures that assess how well people are coping with tasks that may be irrelevant for them. For example, measuring vocational interests may not be important when the person is simply seeking a job (i.e., any type of employment).

Nevertheless, the literature generally supports the idea that career maturity instruments can be very useful in assessing a youth's readiness for vocational planning by providing information on interests, aptitudes, and the amount of occupational information needed by an individual.

Development of the Paper-and-Pencil CMA Instrument

A CMA instrument was needed for research with military applicants and for possible inclusion in an automated computerized vocational guidance (CVG) system under development. None of the available instruments seemed suitable. Interview procedures were

deemed impractical for large-scale testing, such as in military recruiting, because of the time involved in test administration and the large numbers of job applicants. The absence of professional counselors in military recruiting was another factor that precluded interview-based measures. To avoid reliance on commercially available instruments with their associated royalties and use fees, it was decided to design a new, government-owned instrument that will eventually be integrated into a CVG system.

Based on a review of career maturity and decision making literature, Diamond (1985) developed a pilot version of the CMA. The pilot instrument originally consisted of 38 items that provided the opportunity for later elimination of those items with the lowest correlation to the total score. To determine the construct and concurrent validity of the CMA, the 1985 version of the MVS (Holland, 1985) was chosen as the criterion measure. Demographic variables (i.e., gender, age, and level of education) were collected to aid in assessing the validity of the CMA for subgroups.

Both the CMA and MVS were administered to a sample of Army recruits at several U.S. Army bases (N = 405; 323 males and 82 females). Due to errors in testing procedures, not all recruits completed both the CMA and MVS. Thus, statistical analyses were performed on the scores from 401 CMA answer sheets and 304 MVS answer sheets.

Correlations were obtained between all variables: total CMA, total MVS, all CMA and MVS items, gender, age, and education. Results from the 38-item instrument indicated that out of a possible score of 76, the mean was 57.9 and the standard deviation was 11. Alpha was .83, indicating good internal consistency; and the correlation between total CMA and MVS was .75, indicating that the two instruments are probably measuring the same construct (i.e., the vocational needs of the respondents).

Individual item analyses were performed to reduce the number of items. Those items that correlated the least with the total score were eliminated. The revised CMA contained 34 items, slightly more than the originally specified number of items. For the 34-item CMA, alpha increased to .85, and the correlation increased to .78. The median (53) was selected as the cutoff score.

Results showed that respondents with a higher educational level scored higher than respondents with a lower educational level, older recruits scored higher than younger ones, and females scored higher than males. There was no significant difference between the subgroups within each of the variables.

The developer concluded that the reliability of the CMA and its correlation with the MVS supported the application of the instrument as a useful tool for vocational guidance. Because the instrument was construct validated using Army recruits, validation using Navy personnel was required. Because the CMA was developed with the intention of eventually including it in an automated CVG system, programming of the instrument on a stand-alone microcomputer and validation research was required. Further, research was needed to address the problem of setting the appropriate cutoff score. Finally, Diamond pointed to a need to identify specific problems that military job applicants have in vocational decision making.

APPROACH

The current research effort wa organized into four major task areas: (1) construct validation of the CMA with Navy personnel; (2) programming; (3) validation of the automated instrument; and (4) data analyses and instrument refinement.

Construct Validation of the CMA With Navy Personnel

The CMA and MVS were administered to a random sample of male Navy recruits (N = 50) at the RTC in San Diego. There were no women in the Navy sample because female recruits are not trained there. The MVS instrument served as the criterion.

Programming

The paper-and-pencil CMA instrument was programmed in the C-Basic language to operate on a stand-alone Apple IIe microcomputer. The test was not modified in item content or scoring. The wording of the introduction and closing statements was changed for use with Navy applicants. A title was added, Career Plans Check-Up (CPC).

All items on the CMA and CPC are scored 0, 1, 2 (for yes, uncertain, and no, respectively) except for items 9, 10, 16, 21, 30, and 32, which are scored 2, 1, and 0.

Validation of the Automated Instrument

Randomly selected male Navy recruits (N = 100) at RTC in San Diego were individually administered the CPC and the MVS (the criterion measure). The order of the administration of the CPC and the MVS was staggered. In other words, 50 recruits responded to the CPC first, while the remaining recruits responded to the MVS first. Test administration time was recorded for both instruments.

Data Analyses and Instrument Refinement

Reliability for the CMA was estimated by Cronbach's internal consistency model (coefficient alpha; Cronbach, 1951). CPC reliability was not estimated because (1) the content was the same as CMA, and (2) the computer program did not store item responses.

Intercorrelations, means, and standard deviations were calculated for CMA, CPC, MVS, age, and educational level. Summary data for CMA Army and Navy samples were compared. Means were also calculated for CMA and CPC subgroups by age (over or under 25 years) and by four educational levels. Significance of differences between age and education subgroups was determined by the z-ratio statistic (Guilford, 1956).

After the data analyses, the automated instrument was refined. In other words, there were minor changes, such as the slight rewording of a few items and the correction of a few grammatical errors. The refined CPC was programmed (unchanged in content or presentation) to operate on an IBM PC to increase its research and technology transfer potential. A list of the revised CPC items is contained in the appendix. (The Apple IIe program and IBM program are available from NAVPERSRANDCEN).

RESULTS

Reliability and Analyses

Reliability of CMA was high (.82). Comparing CMA Army and Navy samples (Table 1), the mean and median for the Army sample were a few points higher than for the Navy sample. Scores for the Navy CMA and CPC samples (Table 2) were similar.

Table 1

Summary for CMA Army and Navy Samples at
Time 1 and Time 2

Variable	Time 1 (Army)	Time 2 (Navy)
N	401	50
Mean	51.0	48.3
SD	10.7	10.5
Median	53.0	50.0
Mode	54.0	54.0
Skewness	-.75	-.76

Table 2

Summary Data for the CPC and the CMA Navy Samples

Variable	CPC	CMA
N	100	50
Mean	49.1	48.3
SD	11.3	10.5
Median	50.5	50.0
Mode	58.0	54.0
SE mean	1.1	1.5
Skewness	-.51	-.76

Intercorrelations and Validity

Correlations between CMA (predictor) and MVS (criterion) were high (.78, Table 3), as were CPC and MVS (.81, Table 4). Correlations between age and education level were high for both the CMA and the CPC (.63 and .67 respectively). Correlations between other variables were low (-.03 to .21).

Table 3

Intercorrelations of CMA With MVS,
Age, and Educational Level

Variable	MVS	Age	Educational Level
CMA	.78*	.17	.21
MVS		.06	.16
Age			.63*

*p < .01.

Table 4

Intercorrelations of CPC With MVS,
Age, and Educational Level
(N = 100)

Variable	MVS	Age	Educational Level
CPC	.81*	-.03	.03
MVS		-.05	.12
Age			.67*

*p < .01.

Age and Education Subgroups

Although there were some mean differences on CMA (Table 5) and CPC (Table 6) age and education subgroups, none of the differences was statistically significant (at the .05 level), because of very small sample sizes of some subgroups.

Table 5

CMA Means and Standard Deviations
by Age and Level of Education

Variable	N	Mean	SD
Age			
25 and under	44	47.6	10.4
Over 25	6	53.5	10.6
Level of education			
Less than HS grad	3	40.7	11.5
HS grad	28	47.8	11.4
Some college	17	49.9	9.0
College grad	2	53.5	9.2

Table 6

CPC Means and Standard Deviations
by Age and Level of Education

Variable	N	Mean	SD
Age			
25 and under	91	49.3	11.4
Over 25	9	47.9	10.7
Level of education			
Less than HS grad	18	49.1	13.3
HS grad	60	48.2	11.2
Some college	17	54.1	8.8
College grad	5	43.2	8.2

CONCLUSIONS

1. The research was successful in construct validating the CMA on a Navy sample. Summary statistics, reliability, and correlation with the MVS were similar to those found in an earlier Army study (Diamond, 1985). CMA reliability was .85 for the Army sample and .82 for the present Navy sample.

2. The strong correlation (.78) between the CMA and the MVS indicates that they are measuring the same construct (i.e., career maturity).

3. The strong correlation (.81) between the CPC and the MVS indicates that the CPC also taps the career maturity of the recruits. Both the CMA and the CPC are therefore potentially useful in vocational guidance.

RECOMMENDATIONS

1. Document the applicant-recruiter/classifier decision-making process for important categories (school guarantee, GENDET, gender, delayed entry, AFQT category, etc.).

2. Using experienced counselors to interview applicants, document specific topics and areas in which applicants need more guidance.

3. Develop an additional instrument that can quickly identify the needs (documented from recommendation No. 2).

4. Administer the CPC to specific Navy subgroups (in recommendation No. 1). Use the "needs" information (recommendation No. 2) to determine CPC cut-scores for each subgroup.

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APPENDIX

CPC ITEMS

Career Plans Check-Up Items

1. I am afraid of making a career choice because it might be the wrong one for me.

2. I am interested in so many things, I get confused trying to decide what I like best.

3. I usually have trouble making decisions about important things.

4. It's very important that those close to me approve my career choice.

5. It would be easier for me to choose a career if I knew more about my interests and abilities.

6. I don't know enough about the occupations I think I'm interested in--what people do on the job, what the requirements are, and so on.

7. Over the years, I've changed my mind a lot about the kind of work I'd like to do, and I still keep changing my mind.

8. I believe that once I choose and enter a career, it will be too late to change.

9. I am willing to get the necessary training for the career I choose.

10. I have a good idea of whether I prefer working with things, with data, with people, or with ideas.

11. I am not sure where to go to find information about the current job market.

12. I don't like being supervised or taking orders from others.

13. Getting the right job is mostly a matter of luck and knowing the right people.

14. I plan to work only until I've saved enough money to retire.

15. The kind of work that appeals to me most is work I'm not qualified to do.

16. I have a good idea of my interests and abilities and how they relate to different occupations.

17. With so much unemployment and the possibility of war, it seems pointless to plan a career.

18. I envy people who don't have to work.

19. I think most people work because they have to and not because they want to.

20. Even when I make decisions, I am not sure they are the right ones.

21. I have a very good idea of what I want in life.

22. No job or occupation appeals to me particularly.

23. What kind of work I do doesn't make much difference to me.

24. There are so many occupations, I don't know where to begin to find out which ones I should consider.

25. All I ask in a job is that it gives me security.

26. I have little confidence in my abilities.

27. I am afraid to try new things.

28. My first consideration in choosing a career is the amount of money it would pay over the years.

29. I don't seem to have a strong interest in anything.

30. My abilities and interests are strong in the occupational areas I'm interested in.

31. I think there is just one, and only one, "right" job for a person.

32. I look forward to new experiences.

33. Having to make a career choice makes me feel trapped.

34. I like to be sure I will be able to do something well before I even try doing it.

END

8-87

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